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CHEMODIVERGENCE IN METAL-CATALYZED CROSS-DEHYDROGENATIVE COUPLING REACTIONS OF 2H-IMIDAZOLE 1-OXIDES WITH 1H-PYRROLE

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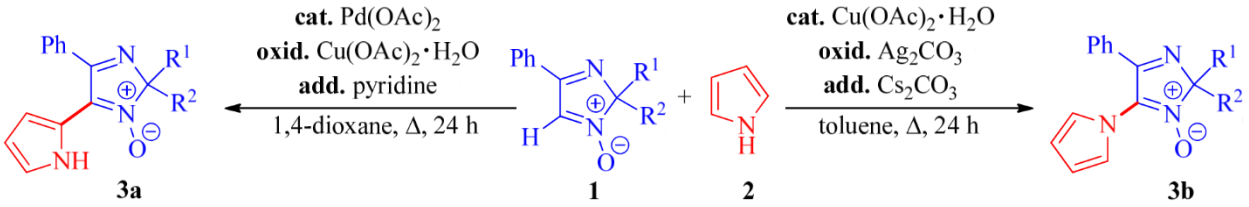
Abstract. 2*H*-imidazole 1-oxide and its derivatives represent organic molecules belonging to a specific class of cyclic nitrones, which have proved themselves not only in terms of their beneficial applications in analytical chemistry, but also in terms of potential use as therapeutics. In this connection, it appears to be a key challenge to develop efficient approaches to functionalization of nitrones in order to obtain novel compounds with improved physical and pharmacological properties.

Our research group has studied the capabilities of transition metal-catalyzed cross-dehydrogenative coupling strategy with regard to the cyclic nitrones, 2*H*-imidazole 1-oxides **1**[1–3] (Scheme 1). In particular, we have found that such compounds are able to interact diversely with 1-unsubstituted 1*H*-pyrrole **2** depending on reaction conditions. Thus, when the palladium(II) catalysis was used, the reaction proceeded in formation of C–C coupling product **3a**;[1] however, in case of the copper(II) catalysis, the same reaction led to the novel C–N bond generation (**3b**). Structures of the products obtained were confirmed by means of NMR spectroscopy.



Scheme 1. Interaction of nitrone **1** with pyrrole **2** under various conditions

References

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